UNITED STATES DISTRICT COURT
DISTRICT OF MAINE

UNITED STATES OF AMERICA	)	
	)	
v.	)	1:15-cr-00003-JAW
	)	
NATHAN BREWER	)	

ORDER ON TREATMENT OF ALPHA-PVP UNDER UNITED STATES SENTENCING GUIDELINES

Nathan Brewer pleaded guilty to one count of engaging in a conspiracy to distribute and possess alpha-pyrrolidinopentiophenone (Alpha-PVP), a controlled substance not listed in the United States Sentencing Guideline Drug Quantity Table or the Drug Equivalency Tables. He now asks the Court to use pyrovalerone, a schedule V substance, not methcathinone, a schedule I substance, to calculate his drug quantity and base offense level under the Sentencing Guidelines, on the ground that Alpha-PVP is more closely related to pyrovalerone. The Court denies Mr. Brewer's request, first because the statute requires a comparison only to a controlled substance in schedules I or II, and also because as a matter of fact Alpha-PVP is more closely related to methcathinone than to pyrovalerone.

I. BACKGROUND

A. The Charge and Conviction

On January 23, 2015, Nathan Brewer waived his right to prosecution by indictment and pleaded guilty to Count 1 of an information, charging him with conspiracy to distribute and possess: (1) prior to March 7, 2014, a mixture or substance containing a detectable amount of Alpha-PVP, a controlled substance

analogue as defined in 21 U.S.C. § 802(32); and (2) from March 7, 2014 until a date unknown, but no earlier than June 1, 2014, a mixture or substance containing a detectable amount of Alpha-PVP, a schedule I controlled substance, all in violation of 21 U.S.C. §§ 813, 841(a)(1), and 846. *Waiver of Indictment* (ECF No. 3); *Information* (ECF No. 4); *Entry* (ECF No. 12).

B. The Presentence Report

On June 17, 2015, the Probation Office (PO) prepared a revised presentence investigation report, which set forth its guideline calculations. *Presentence Investigation Report* (PSR). Based on a total drug quantity of 989.1 kilograms of marijuana equivalent, the PO concluded that Mr. Brewer had a base offense level of 28. *Id.* at 6. To determine drug quantity, the PO attributed to Mr. Brewer: (1) 1.008 kilograms of Alpha-PVP discovered on February 26, 2014, when Mr. Brewer's younger brother picked up a package of bath salts at the post office; (2) 120.8 grams of Alpha-PVP from a June 16, 2014 package also picked up at a post office; and (3) 2,603 grams of Alpha-PVP that reflect sales Mr. Brewer made to a source of information from November 2013 to February 2014. *Id.* at 4-5.

C. The Presentence Conference and Subsequent Memoranda

On August 5, 2015, during a pre-sentence conference, defense counsel argued that the PO and the Drug Enforcement Agency (DEA) had wrongly determined that Alpha-PVP was more closely related to methcathinone for drug quantity purposes, and that instead pyrovalerone – a schedule V controlled substance – was more closely related. *See Entry* (ECF No. 29); *Mot. to Extend Time to Obtain Expert Op. Re: Alpha-*

PVP and Pyrovalerone (ECF No. 30). The Government filed a memorandum on February 12, 2016, submitting that Alpha-PVP should be compared to methcathinone, not pyrovalerone, for sentencing purposes. *Gov't's Mem. in Aid of Sentencing Re: Alpha-PVP, Methcathinone, and Pyrovalerone* (ECF No. 63) (*Gov't's Mot.*). Mr. Brewer responded in opposition to the Government's memorandum on March 11, 2016. *Def.'s Sentencing Mem. in Resp. to Gov't's Mem. Re: the Appl. of Pyrovalerone under the Sentencing Guidelines* (ECF No. 70) (*Def.'s Opp'n*). The Government replied on March 25, 2016. *Gov't's Resp. Mem. in Aid of Sentencing Re: Alpha-PVP, Methcathinone, and Pyrovalerone* (ECF No. 74) (*Gov't's Reply*).

II. THE PARTIES' POSITIONS

A. The Government's Memorandum in Aid of Sentencing Regarding Alpha-PVP, Methcathinone, and Pyrovalerone

The Government argues that Alpha-PVP is substantially similar to methcathinone, a schedule I controlled substance, in both chemical structure and stimulant effect on the central nervous system, and pursuant to 21 U.S.C. § 802(32)(A), under the United States Sentencing Guidelines (U.S.S.G.) should be compared to methcathinone for activity occurring prior to March 7, 2014. *Gov't's Mot.* at 2. In response to Mr. Brewer's claim that pyrovalerone, a schedule V controlled substance, should be used as a controlled substance analogue to Alpha-PVP for sentencing purposes, the Government asserts that a controlled substance analogue can only be compared to substances in schedule I or II, and thus, even if pyrovalerone were more similar in structure and physiological effect, methcathinone is the most appropriate analogue to Alpha-PVP for sentencing. *Id.*

Further, the Government argues that after March 7, 2014, when Alpha-PVP was designated as a schedule I controlled substance but not specifically referenced in the Sentencing Guidelines, in order to determine the correct drug comparison for sentencing purposes, it is necessary to refer to U.S.S.G. § 2D1.1, Application Note 6. *Id.* at 4; *see* Section III(C), *infra.* Applying the Application Note 6 rubric, the Government contends that, based on the reports provided by its experts, Alpha-PVP is substantially similar in chemical structure and physiological effect to methcathinone, and "is at least as potent if not more potent than methcathinone in drug discrimination studies." *Id.*

The Government also points to *United States v. Moreno*, No. 15-cr-15-jdp, 2015 WL 6071680 (E.D. Wis. Oct. 15, 2015) to counter Mr. Brewer's assertion that pyrovalerone is the more closely related analogue to Alpha-PVP. *Id.* at 5. The Eastern District of Wisconsin held:

> The guideline does not instruct the court, as defendants ask, to sentence defendants based on the most closely related controlled substance from among the (expanding) universe of controlled substances. Rather, Application Note 6 tells the court to find the most closely related controlled substance from among those *referenced in the guideline*. Pyrovalerone is not listed in either the Drug Quantity Table or the Drug Equivalency Table. Thus, it is irrelevant how closely analogous Alpha–PVP is to pyrovalerone because pyrovalerone is not an available comparator under the guideline.

Id. (citing *Moreno*, 2015 WL 6071680 at *2) (emphasis in original).

Finally, to rebuff any argument that Alpha-PVP has only minor effects on its users, the Government turns to the testimony from *Moreno* of three Alpha-PVP users, which includes, inter alia, that the drug made them paranoid, unable to sleep, made

other users violent, and was more exhilarating and addictive than methamphetamine. *Id.* at 5-6.

B. Nathan Brewer's Response to the Government

Mr. Brewer does not dispute that Alpha-PVP was a controlled substance analogue prior to March 7, 2014. *Def.'s Opp'n* at 1 n.1. Instead, his argument is that pyrovalerone is more closely related to Alpha-PVP, and pyrovalerone should be considered for sentencing purposes in setting the base offense level under the Sentencing Guidelines.[1] *Id.*

To disprove the Government's experts, Mr. Brewer puts forth two expert opinions to support the assertion that pyrovalerone, not methcathinone, "is the most closely related controlled substance to Alpha-PVP," both structurally and in its effects on the body. *Id.* at 2-3. One expert opinion explicitly states that methcathinone is not to be considered "most similar" structurally to Alpha-PVP, as it has significant molecular differences when compared to Alpha-PVP, while pyrovalerone is almost identical to Alpha-PVP. *Id.* at 2. Mr. Brewer also provides a report that he contends supports that the dosage of pyrovalerone needed to effect the body is no different from Alpha-PVP or methcathinone. *Id.* at 5.

Additionally, Mr. Brewer argues that there is ambiguity regarding whether pyrovalerone can be considered under the Sentencing Guidelines, and as such the rule of lenity "should tip the balance in favor of the application of pyrovalerone." *Id.*

[1] The standard of "most closely related" is based on a potential comparison of a number of substances. U.S.S.G. § 2D1.1, app. n.6. The parties have narrowed the universe of potential analogues to two, methcathinone or pyrovalerone. The question therefore narrows to which of these two substances is "more closely related."

at 6. Specifically, Mr. Brewer turns to the language in Application Note 6 which states: "In the case of a controlled substance that is *not specifically referenced in this guideline*, determine the base offense level using the marihuana equivalency of the *most closely related* controlled substance *referenced* in this guideline." *Id.* at 8 (citing U.S.S.G. § 2D1.1, app. n.6) (emphasis provided by Defendant). From this, he argues that because schedule V controlled substances are "referenced" in the Sentencing Guidelines, and that pyrovalerone is a schedule V controlled substance, there is ambiguity as to whether pyrovalerone is actually a "controlled substance referenced in the guideline." *Id.* Moreover, Mr. Brewer contends that the Government's argument that the "most closely" related controlled substance must be specifically listed in the Sentencing Guideline Table is not supported by the language of Application Note 6. *Id.* at 9. He argues that the Government's position would render meaningless the Sentencing Guidelines' conversion rate of a schedule V controlled substance to marijuana. *Id.* at 10-11.

Finally, Mr. Brewer submits that following the Government's argument would create an unwarranted sentencing disparity under 18 U.S.C. § 3553(a), because he would be sentenced using methcathinone, when pyrovalerone is more similar to Alpha-PVP. *Id.* at 13.

C. The Government's Reply

The Government notes that when considering Mr. Brewer's concession that Alpha-PVP was a controlled substance analogue prior to March 7, 2014 (making it an analogue to a controlled substance in schedule I or II), and the fact that Alpha-PVP

became a schedule I substance after March 7, 2014, it is illogical for Alpha-PVP to be compared to a schedule V controlled substance. *Gov't's Reply* at 1. This point, the Government argues, is further emphasized when the effects of Alpha-PVP on users are taken into consideration, such as paranoia, propensity for violence, and addiction on a level equal to or greater than methamphetamine. *Id.* at 1-2.

Furthermore, the Government disagrees with Mr. Brewer's reading of Application Note 6, and specifically that had the Sentencing Commission intended for "referenced" to apply to an entire schedule of drugs (schedule V), it would have written language to that effect. *Id.* at 2. Likewise, the Government points out that Mr. Brewer's assessment of Application Note 6 ignores Application Note 8(a), which makes it unnecessary to use Application Note 6 for schedule V controlled substances like pyrovalerone because all schedule V controlled substances receive the same marijuana equivalency pursuant to Application Note 8(a). *Id.* at 2-3.

Finally, while the Government agrees that the chemical compositions of pyrovalerone, methcathinone, and Alpha-PVP are similar, with respect to the pharmacological effects of pyrovalerone, it contends that Mr. Brewer's expert has provided limited and confusing evidence on the issue, equivocating on the actual physiological effects of pyrovalerone. *Id.* at 3. The Government's expert, it contends, has provided evidence on the actual physiological effects of using methcathinone and Alpha-PVP, specifically that both produce stimulus effects similar to methamphetamine or cocaine. *Id.* at 4.

III. STATUTORY AND REGULATORY BACKGROUND

A. The Controlled Substance Analogue Enforcement Act of 1986: Application to Pre–March 7, 2014 Conduct

Congress enacted the Controlled Substance Analogue Enforcement Act of 1986 (Analogue Act) "to prevent 'underground chemists' from creating new drugs that have similar effects on the human body as drugs explicitly prohibited under the federal drug laws." *United States v. Ketchen*, No. 1:13-CR-00133-JAW, 2015 WL 3649486, at *6 (D. Me. June 11, 2015) (citing *United States v. McFadden*, 753 F.3d 432, 436 (4th Cir. 2014), *vacated and remanded*, 135 S. Ct. 2298 (2015)[2]; *United States v. Hodge*, 321 F.3d 429, 437 (3d Cir. 2003) (purpose of the Analogue Act is to "make illegal the production of designer drugs and other chemical variants of listed controlled substances that otherwise would escape the reach of the drug laws")). The Analogue Act provides:

> A controlled substance analogue shall, to the extent intended for human consumption, be treated, for the purposes of any Federal law as a controlled substance in schedule I.

21 U.S.C. § 813. Except as provided in subparagraph (C) of 21 U.S.C. § 802(32),[3] the term "controlled substance analogue" means a substance:

> (i) the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II;
>
> (ii) which has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than

[2] The Supreme Court granted certiorari to resolve a circuit split as to whether the government must prove that a defendant knew that the substance constituted a controlled substance analogue, an issue not raised in this motion. On April 21, 2015, the Supreme Court issued *McFadden v. United States*, 135 S. Ct. 2298 (2015) holding that the 21 U.S.C. § 841(a)(1) "requires the Government to establish that he knew he was dealing with a 'controlled substance." *Id.* at 2302.

[3] The exceptions in subparagraph C are not relevant to the issues before the Court. *See* 21 U.S.C. § 802(32)(C).

> the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II; or
>
> (iii) with respect to a particular person, which such person represents or intends to have a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II.

21 U.S.C. § 802(32)(A). Together, these provisions have been interpreted to require the Government prove three elements: (1) substantial chemical similarity between the analogue and the controlled substance (the chemical structure element), *see* 21 U.S.C. § 802(32)(A)(i); (2) substantially similar actual, intended, or represented physiological effects on the central nervous system (the pharmacological similarity element), *see* 21 U.S.C. § 802(32)(A)(i), (ii); and, (3) intent that the substance be consumed by humans (the human consumption element), *see id*. § 813. *See McFadden*, 753 F.3d at 436 (citing *United States v. Klecker*, 348 F.3d 69, 71 (4th Cir. 2003)).

Courts have routinely upheld the application of the Analogue Act to analogue chemicals. *See United States v. Sullivan*, 714 F.3d 1104 (8th Cir. 2013) (4–methylmethcathinone); *United States v. Berger*, 553 F.3d 1107 (8th Cir. 2009) (1,4–butanediol); *United States v. Roberts*, 363 F.3d 118 (2d Cir. 2004) (1,4–butanediol); *United States v. Klecker*, 348 F.3d 69 (4th Cir. 2003) (5–methoxy–N, N-diisopropyltryptamine); *United States v. Washam*, 312 F.3d 926 (8th Cir. 2002) (1,4–butanediol); *United States v. Fisher*, 289 F.3d 1329 (11th Cir. 2002) (gamma-butyrolactone); *United States v. Carlson*, 87 F.3d 440 (11th Cir. 1996) (3,4–

methylenedioxymethamphetamine); *United States v. Hofstatter*, 8 F.3d 316 (6th Cir. 1993) (ephedrine and phenylpropanolamine).

B. Designating Alpha-PVP as a Schedule 1 Controlled Substance

On March 7, 2014, the Deputy Administrator of the DEA issued a final order to temporarily schedule 10 synthetic cathinones into schedule I pursuant to the temporary scheduling provisions of the Controlled Substances Act (CSA). Schedules of Controlled Substances: Temporary Placement of 10 Synthetic Cathinones Into Schedule I, 79 Fed. Reg. 12938 (Mar. 7, 2014). Among the 10 substances, Alpha-PVP was included. *Id.* The DEA further stated that "[t]his action is based on a finding by the Deputy Administrator that the placement of these synthetic cathinones . . . into schedule I of the CSA is necessary to avoid an imminent hazard to the public safety." *Id.* The DEA went on to state:

> Many synthetic cathinones produce pharmacological effects substantially similar to the schedule I substances cathinone, methcathinone, and 3,4-methylenedioxymethamphetamine (MDMA) and schedule II stimulants amphetamine, methamphetamine, and cocaine. [Alpha-PVP is a] synthetic cathinone[] and [is] structurally and pharmacologically similar to amphetamine, MDMA, cathinone, and other related substances. Accordingly, these synthetic cathinone substances share substantial similarities with schedule I and schedule II substances with respect to desired and adverse effects. In general, desired effects reported by abusers of synthetic cathinone substances include euphoria, sense of well-being, increased sociability, energy, empathy, increased alertness, and improved concentration and focus. Abusers also report experiencing unwanted effects such as tremor, vomiting, agitation, sweating, fever, and chest pain. . . . These synthetic cathinone substances have no known medical use in the United States but evidence demonstrates that these substances are being abused by individuals. There have been documented reports of emergency room admissions and deaths associated with the abuse of synthetic cathinone substances.

Id.

C. The Guideline Analysis: U.S.S.G. § 2D1.1

U.S.S.G. § 2D1.1 applies at sentencing for violations of 21 U.S.C. § 841(a). The first step in the drug quantity analysis under U.S.S.G. § 2D1.1 is to determine whether the drug at issue is listed in the Drug Quantity Table (DQT). U.S.S.G. § 2D1.1(c). However, the DQT covers only a small number of controlled substances, and as is the case with Alpha-PVP, when the controlled substance is not in the DQT, the second step is to check the Drug Equivalency Tables (DETs). U.S.S.G. § 2D1.1, app. n.8(D). The DETs convert a larger number of controlled substances into marijuana equivalent weights for purposes of determining the offense level. Alpha–PVP is also not listed in the DETs.

When a substance is not listed in either the DQT or the DETs, Application Note 6 requires that the base offense level be determined using the marijuana equivalency of "the most closely related controlled substance referenced in this guideline." U.S.S.G. § 2D1.1, app. n.6. Application Note 6 reads in relevant part:

> For purposes of this guideline "analogue" has the meaning given the term "controlled substance analogue" in 21 U.S.C. § 802(32). In determining the appropriate sentence, the court also may consider whether the same quantity of analogue produces a greater effect on the central nervous system than the controlled substance for which it is an analogue.
>
> In the case of a controlled substance that is not specifically referenced in this guideline, determine the base offense level using the marihuana equivalency of the most closely related controlled substance referenced in this guideline. In determining the most closely related controlled substance, the court shall, to the extent practicable, consider the following:

> (A) Whether the controlled substance not referenced in this guideline has a chemical structure that is substantially similar to a controlled substance referenced in this guideline.
>
> (B) Whether the controlled substance not referenced in this guideline has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance referenced in this guideline.
>
> (C) Whether a lesser or greater quantity of the controlled substance not referenced in this guideline is needed to produce a substantially similar effect on the central nervous system as a controlled substance referenced in this guideline.

Id.

IV. THE EVIDENCE

Mr. Brewer has not claimed that by possessing and distributing Alpha-PVP he is not guilty of violating the Analogue Act prior to March 7, 2014, nor that he is not guilty of violating the Controlled Substances Act after March 7, 2014. Instead, the sole issue is whether, under Application Note 6 of U.S.S.G. § 2D1.1, Alpha-PVP should be compared to methcathinone or pyrovalerone for sentencing purposes in setting the base offense level under the Sentencing Guidelines. Said another way, the Government and Mr. Brewer have taken different sides of a factual issue: which controlled substance—methcathinone or pyrovalerone—is more closely related to Alpha-PVP. The Government contends that Alpha-PVP is more closely related to methcathinone, a schedule I drug; Mr. Brewer says that Alpha-PVP is more closely related to pyrovalerone, a schedule V drug.[4]

[4] Methcathinone is not listed as a schedule I drug. *See generally* 21 U.S.C. § 812. But DEA regulations, published in the Code of Federal Regulations, classified methcathinone as a schedule I controlled substance. 21 C.F.R. § 1308.11. These regulations have the force of law. *See United States*

A. The Government's Evidence

1. Expert Opinion of Dr. Van Linn

In support of its position, the Government provided the expert opinion of Michael Van Linn, PhD., a Drug Science Specialist with the DEA.[5] *Gov't's Mot. Ex. 1*, *Expert Opp'n of Dr. Van Linn* (ECF Nos. 63, 64-A) (*Van Linn Opp'n*). Dr. Van Linn holds a doctorate in organic chemistry and has been employed by the DEA since March, 2012. *Gov't's Mot. Ex. 2*, *CV of Dr. Van Linn* (ECF Nos. 63, 64-B). In his report, Dr. Van Linn states that Alpha-PVP is "substantially similar in chemical structure to methcathinone, a schedule I substance listed in § 2D1.1, Application Note 8(D)." *Van Linn Opp'n* at 1. Specifically, Mr. Linn asserts that Alpha-PVP and methcathinone "share the same core chemical structure and are both substituted at the α-position, ß-position, and on the nitrogen atom. They are both further classified as ß-keto-phenthylamines or cathinones. Methcathinone is currently the only substance listed in the [Sentencing Guidelines] that is classified as a ß-keto-phenethylamine." *Id.* at 2. Dr. Van Linn concludes:

> In comparing the chemical structures for [Alpha-PVP] and methcathinone . . . the difference in the chemical structures is minor and insignificant given that it consists of only modifications to the alkyl substituents at the α-position and nitrogen atom. Therefore, [Alpha-PVP] is substantially similar in chemical structure to the controlled substance methcathinone, a schedule I substance listed in [U.S.S.G. § 2D1.1, Application Note 8(D)].

Id.

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v. Hussein, 351 F.3d 9, 12 (1st Cir. 2003). Methcathinone is also specifically referenced in the Sentencing Guidelines. *See* U.S.S.G. § 2D1.1 app. n.8(D).

[5] Mr. Brewer has not challenged the expert qualifications of Dr. Van Linn.

2. Expert Opinion of Dr. Fang

In addition, the Government provided the expert opinion of Li Fang, PhD., also a Drug Science Specialist with the DEA.[6] *Gov't's Mot. Ex. 3*, *Expert Opp'n of Dr. Fang* (ECF Nos. 63, 64-C) (*Fang Opp'n*). Dr. Fang holds a doctorate in cell biology and has been employed by the DEA since 2010. *Gov't's Mot. Ex. 4*, *CV of Dr. Fang* (ECF Nos. 63, 64-D). In his report, Dr. Fang opines that Alpha-PVP "has a stimulant effect on the central nervous system that is substantially similar to the stimulant effect on the central nervous system of methcathinone, a . . . schedule I substance." *Fang Opp'n* at 1.

Dr. Fang found that "in laboratory studies investigating the effects of drugs on monoaminergic systems (*in vitro* studies), [Alpha-PVP], like methcathinone, had been shown to bind to dopamine and norepinephrine transporters and to inhibit the uptake of the corresponding monoamine neurotransmitter in transferred cells," and with *in vivo* studies, "[Alpha-PVP], like methcathinone, increases extracellular dopamine concentrations in the brain of rats." *Id.* at 1. Additionally, Dr. Fang states that "[d]ata from drug discrimination studies (*in vivo* studies) demonstrate that [Alpha-PVP], like methcathinone, fully substitutes for the discriminative stimulus effects produced by methamphetamine or cocaine in rats," and that Alpha-PVP "has been reported to produce sympathomimetic effects (agitation and cardiovascular complications) in a user (resulting in his death) which are similar to those that have been observed with stimulant drugs of abuse." *Id.* at 1-2. Further, addressing

[6] Mr. Brewer has not challenged the expert qualifications of Dr. Fang.

U.S.S.G. § 2D1.1, Application Note 6(C), Dr. Fang asserts that "Alpha-PVP is at least as potent if not more potent than methcathinone in drug discrimination studies." *Id.* at 2.

3. Transcript of *US v. Moreno* Sentencing Hearing

The Government also introduces the transcript from the October 1, 2015 sentencing hearing in *United States v. Moreno*, No. 15-cr-15-jdp, United States District Court, Western District of Wisconsin. *Gov't's Mot. Ex. 5*, *Tr. of Sentencing Hr'g* (ECF Nos. 63, 64-E) (*Tr.*). During the hearing, three Alpha-PVP users testified as to the effects of the drug.

The first witness testified that Alpha-PVP made her paranoid, unable to sleep, and gave her the "itchies." *Tr.* at 94:19-95:10. She also testified that it was more exhilarating than methamphetamine. *Id.* at 96:4-6.

The second witness testified that Alpha-PVP made her paranoid, unable to sleep and unable to eat; she lost 80 pounds in two months while using the drug. *Id.* at 105:1-12. She also testified about a father and son that she knew who were also using Alpha-PVP, became violent towards each other, and that the son thought his father was locking girls in a shed even though this was not true. *Id.* at 105:16-24. The witness also testified that the addiction from Alpha-PVP was "way worse" than methamphetamine, *id.* 106:9-14, and that "[t]he rush was way worse." *Id.* at 107:3-4. The witness testified that the time she was on Alpha-PVP was "the worst" time in her life. *Id.* 110:3-7. She ended up losing custody of her first child because of her drug use. *Id.* 110:8-10.

Lastly, the third witness testified that taking Alpha-PVP made her feel paranoid and stated that "[i]f you took too much, it made you feel like you were going crazy." *Id.* at 113:6-9. She further testified that she noticed similar effects in other users. *Id.* at 113:20-114:19. The witness also stated that the effects of Alpha-PVP were worse than methamphetamine:

> I felt like I was going crazy. I mean with the methamphetamine, you can -- I mean if you're not getting yourself completely spun out, you can function for the most part. But the stuff in 2014, you just -- you didn't seem like you could. You couldn't focus. You couldn't think straight. You weren't really sure what was going on around you.

Id. at 114:25-115:11.

B. Nathan Brewer's Evidence

1. Expert Opinion of Dr. Johnson

Mr. Brewer introduces the expert opinion of Richard Johnson, Ph.D., the Global Regulatory Leader managing regulatory compliance for Penn Color, Inc.[7] *Def.'s Opp'n Ex. 1*, *Expert Opp'n of Dr. Johnson* (ECF No. 70-1) (*Johnson Opp'n*). Dr. Johnson holds a doctorate in physical organic chemistry. *Def.'s Opp'n Ex. 2*, *CV of Dr. Johnson* (ECF No. 70-2). In his report, regarding chemical structure, Dr. Johnson concluded:

> In summary, the "most similar" listed drug to [Alpha-PVP] must be selected from a cathinone derivative. . . . Among the cathinone drugs that are listed, pyrovalerone . . . must be considered as the "most similar", since it differs from [Alpha-PVP] only with regard to the addition of a single methyl group on the phenyl ring at a position far from the key carbonyl and nitrogen functional groups. Methcathinone . . . and cathinone . . . are not to be considered as "most similar", because they have a different structure around the nitrogen atom, and these are

[7] The Government has not challenged the expert qualifications of Dr. Johnson.

> differences that must be considered as significant, when compared to the small difference identified for [pyrovalerone].

Johnson Opp'n at 3-4. As for effects on the body, Dr. Johnson submitted, based upon a study conducted by Meltzer et al.,[8] that pyrovalerone and Alpha-PVP "are not very active regarding the biological activity related to serotonin," while they are "more active in the dopamine . . . and norepinephrine . . . analysis." *Id.* at 4. Dr. Johnson concluded:

> [Alpha-PVP] is seen to have biological activity that is very similar to pyrovalerone. . . . On the other hand, since cathinone and methcathinone do not have the nitrogen group bound in the pyrrolidine ring structure, then the biological activity of these two substances would be predicted to differ significantly from [Alpha-PVP], which is what is observed when comparing [Alpha-PVP] to [a compound with a dissimilar structure around the nitrogen group].

Id. at 5.

2. Expert Opinion of Mr. Demers

Additionally, Mr. Brewer provides the expert opinion of Patrick Demers, M.S., a forensic chemist.[9] *Def.'s Opp'n Ex. 5*, *Expert Opp'n of Mr. Demers* (ECF No. 70-4) (*Demers Opp'n*). Mr. Demers has a master of science in forensic chemistry. *Def.'s Opp'n Ex. 6*, *CV of Mr. Demers* (ECF No. 70-5). Mr. Demers conducted a comparison of the pharmacological effects of Alpha-PVP, methcathinone, and pyrovalerone, and found:

> All three drugs are of the cathinone class and are much like amphetamines in chemical composition and effect. . . . Methcathinone and Pyrovalerone are naturally occurring cathinone drugs while [Alpha-PVP] is a synthetic drug. The two naturally occurring drugs exert their effect as a result of norepinephrine-dopamine reuptake inhibition

[8] *Def.'s Opp'n Ex. 4*, *Meltzer Study* (ECF No. 70-3).

[9] The Government has not challenged the expert qualifications of Mr. Demers.

> (NDRI) which results in an increase of certain types of neurotransmission (stimulation). This type of NDRI activity is also suspected as the mode of action for [Alpha-PVP] however no significant research has been done with that substance to demonstrate the mode of action. Although a general stimulant effect is present with the administration of this class of drugs (cathinone), the intensity, duration and side effects per dose vary with each compound and therefore few if any comparisons about potency and similarities can be made to show that one is stronger or weaker than the other. All effects with drugs are dosage related and unique to that drug. A classification system for drugs of abuse must be made using an empirical evaluation process based on risk factors for each substance. Any effort to assess drugs based on class characteristics is not scientifically valid.

Demers Opp'n at 1-2.

V. DISCUSSION

A. The Significance of the Dispute

For many controlled substances, the Sentencing Guidelines provide a conversion table, which translates a specific drug quantity into its marijuana equivalent. U.S.S.G. § 2D1.1, app. n.8. However, when dealing with a "controlled substance not referenced in the drug quantity table," the guidelines direct that the "Drug Equivalency Tables" be used "to convert the quantity of the controlled substance involved in the offense to its equivalent quantity of marihuana." U.S.S.G. § 2D1.1, app. n.8(A)(i).

The Government asks the Court to find that Alpha-PVP is more closely related to methcathinone, which is specifically referenced in the Sentencing Guidelines and has a marijuana equivalency of 380 grams (G) per one G of methcathinone. Mr. Brewer asks the Court to find that Alpha-PVP is more closely related to pyrovalerone, which is a schedule V controlled substance not specifically identified in the

Sentencing Guidelines. The Drug Quantity Table set forth in U.S.S.G. § 2D1.1 provides a marijuana equivalency of 0.00625 G for one unit of a schedule V controlled substance. Application Note 8(B) to U.S.S.G. § 2D1.1 provides that "[f]or certain types of controlled substances, the [marijuana] equivalencies in the Drug Equivalency Tables are 'capped' at specific amounts." The note provides that the combined weight of all schedule V controlled substances shall not exceed 2.49 kilograms (KG) of marijuana.

The revised PSR calculates that Mr. Brewer was accountable for 2,603 G of Alpha-PVP. When methcathinone is considered the "most closely" related controlled substance, Mr. Brewer is liable for 989.14 KG of marijuana equivalent.[10] In extreme contrast, as Application Note 8(B) provides, the combined weight of all schedule V controlled substances shall not exceed 2.49 KG of marijuana equivalent.

Under U.S.S.G. § 2D1.1(c)(6), 989.14 KG of marijuana results in a base offense level of 28; 2.49 KG of marijuana results in a base offense level of 8. U.S.S.G. § 2D1.1(c)(16). The PSR calculated Mr. Brewer's total criminal history score as a four, which under the table in U.S.S.G. Chapter 5, Part A, establishes a criminal history category of III. Under the Sentencing Guidelines, a base offense level of 28 with criminal history category of III carries with it a guideline sentence range of 97-121 months; for a base offense level of 8, it is 6-12 months.

[10] Methcathinone has a marijuana equivalency of 380 G per one G of methcathinone. Thus, 2,603 G x 380 G = 989,140 G, or 989.140 KG of marijuana equivalent.

B. *Moreno* and *Emerson*

Before conducting its analysis, the Court addresses two recent United States District Court decisions that dealt directly with whether methcathinone or pyrovalerone is the proper marijuana equivalent for Alpha-PVP. In October, 2015, the Western District of Wisconsin issued *Moreno*. Specifically, the district court determined:

> The guideline does not instruct the court, as defendants ask, to sentence defendants based on the most closely related controlled substance from among the (expanding) universe of controlled substances. Rather, Application Note 6 tells the court to find the most closely related controlled substance from among those *referenced in the guideline*. Pyrovalerone is not listed in either the Drug Quantity Table or the Drug Equivalency Table. Thus, it is irrelevant how closely analogous Alpha–PVP is to pyrovalerone because pyrovalerone is not an available comparator under the guideline.

Moreno, 2015 WL 6071680, at *3 (emphasis in original). In March, 2016, the District of Vermont declined to follow *Moreno's* reasoning, finding instead that "[t]he Sentencing Guidelines specifically reference Schedule V drugs as a source of marijuana equivalency and thus pyrovalerone should be considered for the 'most closely related' determination, consistent with the rule of lenity." *United States v. Emerson*, No. 2:15-CR-17, 2016 WL 1047006, at *2, 2016 U.S. Dist. LEXIS 30651, at *4 (D. Vt. Mar. 10, 2016). In making its determination, the District of Vermont quoted this Court's decision in *Ketchen*, describing the holding as:

> observing that pyrovalerone is not specifically referenced in the Sentencing Guidelines but nonetheless analyzing it under the 'most closely related' test and concluding '[b]ased on the evidence now before the [c]ourt, the [District of Maine] finds that the [g]overnment has demonstrated that MDPV is a 'controlled substance analogue' to methcathinone, a Schedule I controlled substance, and the [c]ourt finds

> that the evidence does not support the [d]efendants' assertion that MDPV is a 'controlled substance analogue' to pyrovalerone'.

Id. (quoting *Ketchen*, 2015 WL 3649486, at *16).

C. Analysis: Pyrovalerone as a Schedule V Controlled Substance

Although good arguments may be made for either position, the Court adopts the reasoning of the District of Vermont on whether pyrovalerone is referenced in the Guidelines. *See id.* Section 811 of title 21 grants the Attorney General of the United States the authority to add a drug to a schedule under title 21 if she (1) determines the substance has a potential for abuse and (2) makes the findings prescribed in 21 U.S.C. § 811(b). 21 U.S.C. § 811(a)(1)(A)-(B). Pursuant to this authority, the Attorney General listed pyrovalerone as a schedule V substance. 21 C.F.R. § 1308.15(d)(1). Turning to the Guidelines, U.S.S.G. § 2D1.1, application note 8(D) provides that the drug equivalency for schedule V substances is 0.00625 grams of marihuana for each unit of a schedule V substance, subject to the cap imposed in application note B.

The critical language is in application note 6 to U.S.S.G. § 2D1.1:

> In the case of a controlled substance that is not specifically referenced in this guideline, determine the base offense level using the marihuana equivalency of the most closely related controlled substance referenced in this guideline.

If the Sentencing Commission had wished to limit the analysis of analogue substances to those listed in the Drug Quantity Table or the Drug Equivalency Tables, it could easily have said so. Instead, the Commission used a more general

term, "referenced," and by operation of law, the Guidelines reference pyrovalerone when the Attorney General added pyrovalerone as a schedule V controlled substance.

As the Guidelines reference schedule V substances, and as pyrovalerone is listed in the Code of Federal Regulations as a schedule V substance, the Court concludes that the Guidelines reference pyrovalerone. *Emerson*, 2016 U.S. Dist. LEXIS 30651, at *5 ("The Sentencing Guidelines specifically reference Schedule V drugs as a source of marijuana equivalency and thus pryovalerone should be considered for the 'most closely related' determination, consistent with the rule of lenity").

D. Analogue Substances and the Schedules

The Court's conclusion about pyrovalerone and schedule V takes Mr. Brewer only so far. This is because his argument runs straight into a separate provision of the Guidelines dealing with controlled substance analogues. As the Court described in *Ketchen*, 2015 WL 3649486, at *17, the first paragraph of Application Note 6 contains critical language directing the Court to the correct analytic path for controlled substance analogues:

> For the purposes of this guideline, "analogue" has the meaning given the term "controlled substance analogue" in 21 U.S.C. § 802(32).

U.S.S.G. § 2D1.1., app. n.6. The Guideline expressly incorporates the language of § 802(32)(A)(i)-(iii). Subsection (i) provides:

> [T]he term "controlled substance analogue" means a substance (i) the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II. . . .

21 U.S.C. § 802(32)(A)(i). The last phrase, "substantially similar to . . . a controlled substance *in schedule I or II*" (emphasis supplied), which also appears in subsections (ii) and (iii), makes clear that Alpha-PVP cannot be considered a controlled substance analogue of pyrovalerone for Mr. Brewer's activities prior to March 7, 2014. By their terms, the Guidelines do not allow a comparison between the alleged analogue and pyrovalerone because pyrovalerone is a schedule V substance. In other words, the Commission has determined that to constitute an analogue under the Guidelines, the chemical structure of the analogue must be similar to the chemical structure of a schedule I or II controlled substance. If not, the analogue does not meet the definition of "controlled substance analogue" under the Guidelines.

The Guidelines' treatment of controlled substance analogues is consistent with the Analogue Act. As earlier noted, section 813 of title 21 provides:

> A controlled substance analogue shall, to the extent intended for human consumption, be treated, for the purposes of any Federal law as a controlled substance in Schedule I.

McFadden, 135 S. Ct. at 2301 ("The [Analogue Act] identifies a category of substances substantially similar to those listed on the federal controlled substance schedules, 21 U.S.C. § 802(32)(A), and then instructs courts to treat those analogues, if intended for human consumption, as controlled substances listed on schedule I for purposes of federal law, § 813"). Here, there is no dispute that Alpha-PVP was intended for human consumption. This means that for statutory purposes, Alpha-PVP must be treated as a schedule I substance.

The *McFadden* Court further explained that to prove a defendant is guilty of violating the Analogue Act, the government must demonstrate either that the defendant "knew that the substance with which he was dealing is some controlled substance—that is, one actually listed on the federal drug schedules or treated as such by operation of the Analogue Act—regardless of whether he knew the particular identity of the substance," *id.* at 2305, or alternatively, the government may show:

> [T]he defendant knew the specific analogue he was dealing with, even if he did not know its legal status as an analogue. The Analogue Act defines a controlled substance analogue by its features, as a substance 'the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II'; 'which has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than' the effect of a controlled substance in schedule I or II; or which is represented or intended to have that effect with respect to particular person. § 802(32)(A). A defendant who possesses a substance with knowledge of those features knows all of the facts that make his conduct illegal, just as a defendant who knows he possesses heroin knows all of the facts that make his conduct illegal. A defendant need not know of the existence of the Analogue Act to know that he was dealing with 'a controlled substance.'

Id.

As the Supreme Court explained in *McFadden*, criminal responsibility under the Analogue Act is tied directly to schedules I and II. To interpret the Guidelines as referencing schedules I and II for purposes of sentencing would be consistent with the Supreme Court's interpretation of the Analogue Act for purposes of criminal liability for the same conduct. Put differently, it would be odd for the law to treat Alpha-PVP as a schedule I or II substance for purposes of criminal responsibility, but as a schedule V substance for purposes of punishment.

The Court has been unable to find any official explanation as to why the Analogue Act and the Guidelines restrict themselves to schedules I and II. But it is easy to postulate a reason. The Analogue Act is different from the Controlled Substances Act. A person who intentionally deals heroin, for example, can hardly claim that he or she did not know the drug was illegal or addictive. *See McFadden*, 135 S. Ct. at 2304 ("Take, for example, a defendant who know he is distributing heroin but does not know that heroin is listed on the schedules, 21 C.F.R. § 1309.11 (2014). Because ignorance of the law is typically no defense to criminal prosecution, this defendant would also be guilty of knowingly distributing 'a controlled substance'"). But a person who deals in a substance that is an analogue to a controlled substance might be flirting with a blurry line between chemical experimentation and criminal activity.

It may be the Analogue Act and the Guidelines are making certain that the person who crosses that line is dealing only with the most lethal controlled substances, namely the ones listed in schedules I and II, which have the most obvious deleterious impact. *See* 21 U.S.C. § 812(b)(1) (schedule I: high potential for abuse, no currently accepted medical use in treatment, a lack of accepted safety for use of the drug or other substance under medical supervision); *id.* § 812(b)(2) (schedule II: high potential for abuse, a currently accepted medical use in treatment or a currently accepted medical use with severe restrictions, and abuse of the drug or other substances may lead to severe psychological or physical dependence). From the policy viewpoint, perhaps Congress and the Commission decided against criminalizing the

production of an analogue substance that, as in schedule V, has only a "low potential for abuse," a "currently accepted medical use," and "may lead to limited physical dependence or psychological dependence." 21 U.S.C. § 812(b)(5).

In keeping with the language of the statute and the Guidelines, the Court's analysis must be restricted to whether Alpha-PVP fits within the statutory and Guideline criteria for a schedule I or II controlled substance. *See* 21 U.S.C. § 802(32)(A)(i)-(iii); U.S.S.G. § 2D1.1, app. n.6. Here, the only schedule I or II controlled substance offered for comparison to Alpha-PVP was methcathinone, and as the Court discusses below, the Government's experts opined that Alpha-PVP has a chemical structure and physiological effect that is substantially similar to methcathinone.[11]

Furthermore, whatever the merits of Mr. Brewer's argument for the period prior to March 7, 2014, his argument as to his conduct after March 7, 2014 falls hard of its own weight. To interpret the DEA's order listing Alpha-PVP as a schedule I controlled substance as allowing the Court to compare Alpha-PVP to a schedule V controlled substance would be illogical. Moreover, assuming that Alpha-PVP's status as a schedule I controlled substance for sentencing purposes was clearly established as of March 7, 2014, Mr. Brewer's argument that Alpha-PVP should be deemed a schedule V substance before March 7, 2014 would make for a highly incongruous result: Alpha-PVP would be deemed analogous to a schedule V controlled substance

[11] The Court does not separately address the third element, human consumption. Presumably, all three drugs, Alpha-PVP, pyrovalerone and methcathinone, meet that criterion. Moreover, by not disputing that Alpha-PVP was a controlled substance analogue prior to March 7, 2014, Mr. Brewer admits that it was intended for human consumption. *Def.'s Opp'n* at 1 n.1.

for periods before March 7, 2014 and analogous to a schedule I controlled substance after March 7, 2014.

E. Analysis under Application Note 6

Under Application Note 6 the Court is not required to find that a proposed comparator is the single most closely related controlled substance under each of the three criteria – chemical structure, pharmacological effect, and potency. U.S.S.G. § 2D1.1, app. n.6(A)-(C). Instead, the objective is to determine which controlled substance, on the whole, under these criteria, is the "most closely related" for purposes of sentencing. *Id.* § 2D1.1, app. n.6.

1. Chemical Structure

The Government's expert opined that Alpha-PVP and methcathinone "share the same core chemical structure and are both substituted at the α-position, ß-position, and on the nitrogen atom. They are both further classified as ß-keto-phenthylamines or cathinones. Methcathinone is currently the only substance listed in the [U.S.S.G.] that is classified as a ß-keto-phenethylamine." *Van Linn Opp'n* at 2. Dr. Van Linn concluded that "the difference in the chemical structures is minor and insignificant given that it consists of only modifications to the alkyl substituents at the α-position and nitrogen atom. Therefore, [Alpha-PVP] is substantially similar in chemical structure to the controlled substance methcathinone." *Id.*

In contrast, Mr. Brewer's expert found that with chemical structure, the "most similar" listed drug to Alpha-PVP is pyrovalerone, "since it differs from [Alpha-PVP] only with regard to the addition of a single methyl group on the phenyl ring at a

position far from the key carbonyl and nitrogen functional groups." *Johnson Opp'n* at 3. Moreover, he concluded that methcathinone should not to be considered as "most similar," because it has "a different structure around the nitrogen atom, and these are differences that must be considered as significant, when compared to the small difference identified for [pyrovalerone]." *Id.* at 3-4.

The Court finds that both methcathinone and pyrovalerone qualify as having chemical structures that are substantially similar to Alpha-PVP. The Court also finds, however, that Alpha-PVP is more similar to pyrovalerone in its chemical structure than it is to methcathinone. This is done with the acknowledgement that Application Note 6 only requires that Alpha-PVP be substantially similar in its chemical structure to a controlled substance referenced in the Sentencing Guidelines and not the most similar among comparable drugs. *See Emerson*, 2016 WL 1047006, at *3.

The Court's conclusion on this point dovetails with the conclusion of the United States District Court for the District of Hawaii in its dealing with ethylone, another proposed analogue. In *United States v. Holmes*, CR No. 15-00245-01 SOM; CR No. 15-00410-01 SOM, 2016 U.S. Dist. LEXIS 54044 (D. Ha. Apr. 22, 2016), the District Court reached a similar conclusion addressing a comparison between ethylone and methcathinone:

> Fortunately, at least for purposes of the task now before this court, the court need not determine whether ethylone's chemical structure is more similar to MDEA than to methcathinone, or vice versa. Application Note 6 directs the court to examine whether ethylone "has a chemical structure that is substantially similar to a controlled substance referenced" in § 2D1.1. The language of Application Note 6

> suggests to this court that it need not determine whether ethylone is more similar to MDEA than to methcathinone or more similar to methcathinone than to MDEA. Rather, this court need only determine whether a listed substance has a chemical structure that is substantially similar to ethylone. This court concludes that ethylone has a chemical structure that is substantially similar to **both** MDEA and methcathinone. Nothing in Application Note 6 restricts this court to recognizing only a single substantially similar chemical structure.

Id. at *20-21 (emphasis in original).

2. Pharmacological Effect

The Government's expert found that Alpha-PVP "has a stimulant effect on the central nervous system that is substantially similar to the stimulant effect on the central nervous system of methcathinone, a . . . schedule I substance." *Fang Opp'n* at 1. Specifically, Dr. Fang stated that "[d]ata from drug discrimination studies (*in vivo* studies) demonstrate that [Alpha-PVP], like methcathinone, fully substitutes for the discriminative stimulus effects produced by methamphetamine or cocaine in rats," and that Alpha-PVP "has been reported to produce sympathomimetic effects (agitation and cardiovascular complications) in a user (resulting in his death) which are similar to those that have been observed with stimulant drugs of abuse." *Id.* at 1-2.

Mr. Brewer's expert established that Alpha-PVP "is seen to have biological activity that is very similar to pyrovalerone," and concluded that:

> [S]ince cathinone and methcathinone do not have the nitrogen group bound in the pyrrolidine ring structure, then the biological activity of these two substances would be predicted to differ significantly from [Alpha-PVP], which is what is observed when comparing [Alpha-PVP] to [a compound with a dissimilar structure around the nitrogen group].

Johnson Opp'n at 5. However, Mr. Brewer's other expert, Mr. Demers, found that when comparing Alpha-PVP, methcathinone, and pyrovalerone, "[a]ll three drugs are of the cathinone class and are much like amphetamines in chemical composition and effect." *Demers Opp'n* at 1. Moreover, Mr. Demers opined:

> Although a general stimulant effect is present with the administration of this class of drugs (cathinone), the intensity, duration and side effects per dose vary with each compound and therefore few if any comparisons about potency and similarities can be made to show that one is stronger or weaker than the other. All effects with drugs are dosage related and unique to that drug. A classification system for drugs of abuse must be made using an empirical evaluation process based on risk factors for each substance. Any effort to assess drugs based on class characteristics is not scientifically valid.

Id. at 1-2.

Mr. Brewer's experts are at odds. Though Dr. Johnson found significant differences between Alpha-PVP and methcathinone and strong similarities between Alpha-PVP and pyrovalerone, Mr. Demers concluded that the three drugs "are much like amphetamines in chemical composition and effect," while stating that few comparisons can be made about potency and physiological effect. Juxtaposed, the Government's expert, Dr. Fang, found that *in vivo* studies on rats "demonstrate that [Alpha-PVP], like methcathinone, fully substitutes for the discriminative stimulus effects produced by methamphetamine or cocaine." *Fang Opp'n* at 1. The Court concludes that Mr. Brewer has failed to show that pyrovalerone is more similar to Alpha-PVP than methcathinone, but has sustained his burden to demonstrate that Alpha-PVP's effect on the central nervous system is substantially similar to pyrovalerone. However, the Government has also sustained its burden to

demonstrate that Alpha-PVP's effect on the central nervous system is substantially similar to methcathinone.

3. Potency

Regarding potency or dosage of the compounds, Dr. Fang offered a brief opinion that "Alpha-PVP is at least as potent if not more potent than methcathinone in drug discrimination studies." *Fang Opp'n* at 2. Mr. Demers concluded, regarding cathinones like Alpha-PVP, methcathinone, and pyrovalerone, that "the intensity, duration and side effects per dose vary with each compound and therefore few if any comparisons about potency and similarities can be made to show that one is stronger or weaker than the other." *Demers Opp'n* at 1-2.

With this evidence alone, neither party has met its burden in comparing Alpha-PVP's potency to pyrovalerone or methcathinone. However, the Government also provided the transcript from the sentencing hearing in *Moreno*. *See Tr.* 94:19-115:11. Three witnesses that used Alpha-PVP offered testimony that its effects were more potent that methamphetamine, a schedule II controlled substance, and made it clear that Alpha-PVP has detrimental and dangerous impacts on its users' lives. In considering this evidence, in addition to Dr. Fang's opinion on potency, the Court finds that the Government has sustained its burden by a preponderance of the evidence that Alpha-PVP is more potent than methamphetamine, and thus is at least as potent as methcathinone.[12]

[12] Under the Sentencing Guidelines, 1 G of methamphetamine converts to 2 KG of marijuana equivalent, while 1 G of methcathinone coverts to 380 G of marijuana equivalent. *See Moreno*, 2015 WL 6071680, at *5 n.5.

4. "The Most Closely Related Controlled Substance"

Based on the foregoing, the Court concludes that only methcathinone satisfies the "most closely related" test under U.S.S.G. § 2D1.1, Application Note 6. Moreover, the Court notes that in scheduling Alpha-PVP, the DEA found that Alpha-PVP can cause acute health problems, violent behaviors, and death. Schedules of Controlled Substances: Temporary Placement of 10 Synthetic Cathinones Into Schedule I, 79 Fed. Reg. 12938 (Mar. 7, 2014). The DEA placed Alpha-PVP in schedule I to reflect its findings that Alpha-PVP is a dangerous drug with a high potential for abuse and no currently accepted medical use.

Based on compelling evidence, the Court also finds that Alpha-PVP is unlike other substances listed in schedule V. Again, the statutory definition of schedule V controlled substances requires that (1) the "drug or other substance has a low potential for abuse relative to the drugs or other substances in schedule IV," (2) the "drug or other substance has a currently accepted medical use in treatment in the United States," and (3) "[a]buse of the drug or other substance may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in schedule IV." 21 U.S.C. § 812(b)(5)(A)-(C). For example, the statute treats codeine differently depending on its concentration: not more than 1.8 grams of codeine per 100 milliliters or not more than 90 milligrams per dosage unit, with an equal or greater quantity of an isoquinoline alkaloid of opium results in a schedule III classification. *Id.* Schedule III(d)(1). To be classified as a schedule V controlled substance, codeine must be not more than 200 milligrams per 100 milliliters or per

100 grams, an extremely low concentration. *Id.* Schedule V(1). Other examples of statutorily-listed schedule V substances include not more than 100 milligrams of ethylmorphine per 100 milliliters or 100 grams (a cough suppressant), *id.* Schedule V(3), and diphenoxylate not more than 2.5 milligrams and not less than 25 micrograms of atropine sulfate per dosage unit (an anti-diarrheal medicine). *Id.* Schedule V(4).

These schedule V examples are markedly inconsistent with the classification of pyrovalerone as a schedule V substance. If pyrovalerone is chemically similar to Alpha-PVP and if pyrovalerone is as highly addictive as Alpha-PVP, then it seems more likely that pyrovalerone is misclassified as a schedule V substance than that Alpha-PVP should be deemed as benign as cough syrup or antidiarrheal medicine.

Finally, to find Alpha-PVP "most closely related" to pyrovalerone would run contrary to the Sentencing Guidelines requirement under § 2D1.1 that a "minimum offense level from the Drug Quantity Table for any . . . controlled substances [i.e., Schedule I and II drugs] individually, or in combination with another controlled substance, is level 12." U.S.S.G. § 2D1.1, Notes to Drug Quantity Table. This shows an intent to ensure that a conviction for distribution of a schedule I controlled substance like Alpha-PVP does not result in a base offense level below 12. Mr. Brewer's proposed use of pyrovalerone as the "most closely related" drug would yield a base offense level of 8. *See Emerson*, 2016 WL 1047006, at *5.

The Court concludes that in fixing the Guideline provision applicable to Mr. Brewer's criminal conduct, methcathinone is the "most closely related" controlled substance to Alpha-PVP.

VI. CONCLUSION

The Court concludes that a preponderance of the evidence supports that methcathinone is the appropriate substance to use in calculating Mr. Brewer's base offense level.

SO ORDERED.

/s/ John A. Woodcock, Jr.
JOHN A. WOODCOCK, JR.
UNITED STATES DISTRICT JUDGE

Dated this 28th day of June, 2016